Patent application of

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for

Versatile panel with internal extruded profiles

BACKGROUND OF THE INVENTION :

Field of the invention :

The invention relates generally to doors and cabinetry but more particularly to a system of assemblable panels for multipurpose usage as doors or cabinetry doors.

Background of the invention :

Extrusion frames have been known and used for years, especially in the making of window frames as several patents attest to. Extrusion profiles have also been used for creating various structures but many of these frames are meant to be permanent once they are assembled. Those that are meant to be dissassemblable usually require visible exposed screws or similar mechanical fastening means. These visible mechanical fastening means can mar an otherwise esthetically pleasing surface. There is therefore a need for an assembly process and method to make easily assemblable and disassemblable panels having invisible fastening means.

SUMMARY OF THE INVENTION

This invention is mainly used to assemble diverse panels in a simple, efficient and secure manner. These panels can be used to make cabinets such as kitchen cabinets, garage or basement storage cupboards but also for use in commercial applications such as laboratories, offices, workshops and so on. Its main component is a rigid peripheral frame which serves as a base structure onto which are put flat surfacing materials such as glass, metal, wood or any of a variety of composite materials normally used for making cabinetry.

The panel contains internal extruded profiles. Its applications are versatile (flush panel, glazed panel, door panel, single or double panel, etc.). It can be used indoors as well as outdoors, and once assembled, there are no visible screws or mechanical fasteners of any kind. The panel also allows for easy replacement of defective or broken parts and can be assembled as a kit.

The panel is easy to manufacture without no need for bending or folding tools and does not require any welding of parts at all. The frame structure is solid, durable and weather resistant. The panels can accept most of the standard accessories used in cabinetry such as hinges and handles.

Because there are no visible mechanical fasteners the finished surface can be made very smooth, moreover, it can be made entirely of aseptic materials such as stainless

steel and/or aluminum si it can produce cabinet frames and doors that will not harbor germs, which is ideal for hospitals and laboratories.

The foregoing and other objects, features, and advantages of this invention will become more readily apparent from the following detailed description of a preferred embodiment with reference to the accompanying drawings, wherein the preferred embodiment of the invention is shown and described, by way of examples. As will be realized, the invention is capable of other and different embodiments, and its several details are capable of modifications in various obvious respects, all without departing from the invention. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

BRIEF DESCRIPTION OF THE PREFERRED EMBODIMENT

Figs. 1abcd cross sectional views of the base elements of the profiles.

Figs. 2ab cross sectional views of sample profiles

Figs. 3abc front elevation of a frame being assembled in its open configuration with partial profiles in top elevations.

Figs. 3de continuing with the frame being assembled in semi closed, and closed configuration respectively.

Fig. 4 Perspective view of frames prior to assembly with block spacer.

Figs. 5abc front face of a panel, top side of a panel, and side cross section of a panel, respectively.

Figs. 6ab Front elevation of a panel with hinges and and front elevation of a panel with a handle, respectively.

Figs. 7abcd Show various front elevations of combinations of profiles to make a variety of panels.

Figs. 8ab front elevation of a glazed panel and top elevation of the profile, respectively.

Figs. 9abc side, front and back views of a panel, respectively.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Figs. 1a-d show the 4 base elements from which all profiles are built.

Element 1a (100) has a flat surface (12) and a pair of hooks (14).

Element 1b (200) has an edge (16), channels (56), and a profile fin (18)

Element 1c (300) has a hookable groove (20), channels (56), and clips (46)

Element 1d (400) has a little hook (22) and a trim face (24)

Using these elements in combination produces profiles (500, 600) such as in **Figs. 2ab** where elements 1b, 1c, and 1d (200, 300, 400) are cojoined to create profile 2a (500). Using elements 1a, 1b, and 1c (100, 200, 300) produces profile 2b (600).

Element 1c (300) has legs (46) which snap into receiving protrusions (48) which are part of element 1b (200).

Profiles 2a (500) and 2b (600) show other components not part of the profiles per se such as a locking trim (26) which has both a decorative and a useful purpose which will be explained later.

Once a profile (500 or 600) is partially assembled, finishing surfaces known as fascia (28) are inserted, but more on that later. With these two profiles (500 and 600), a frame (30) can be assembled.

Looking at **Fig. 3a**, the first step in assembling the frame (30) is in having corner threaded mechanical fasteners (32), that is one pair per each corner of the frame (30) in position **AA** as determined by the position of threaded mechanical fasteners (32) in relation to their slots (34). The vertical section of the frame (30') has two vertical slots while the horizontal section of the frame (30") has two horizontal slots and all of the slots are designed to afford a certain range of motion to each section of the frame (30', 30"). At any rate, the orientation of the slots (34) is always so that their long side is running parallel to the length of that particular section of frame (30' or 30"), whether these sections are from profiles 2a or 2b (500, 600). At the intersection of both frames (30', 30") Only elements 1b (200) as per **Figs. 3bc** but beyond the intersection, element c (300) can be added. In position **AA** the frame (30) is expanded and can receive a first fascia (28) (shown in **Fig. 5a**), the size of the fascia (28) is such that it is slightly larger than what the inner perimeter of the frame (30) will be once closed, that way, when moving from position **AA** to position **BA** as per **Fig. 3d**, where the vertical section of the frame (30') is closed in, the edges of the fascia are inserted into slits (42) as seen in **Fig. 5bc**. The threaded mechanical fasteners (32) are still accessible and remain accessible even when moving to position **BB** as per **Fig. 3** where both the horizontal and vertical sections of the frame (30', 30") are closed in. Once closed in, the mechanical fasteners can be tighten to secure the

assembled frame. Of course, the order in which the frame is closed in whether the horizontal side of the frame or the vertical side is of no importance.

Fig. 4 shows a block spacer (70) which lies between frame (30') and frame (30"), the thickness of the block spacer (70) depends upon the thickness of the edge (16).

An assembled panel (38) can be seen in **Fig. 5a** where the frame (30) holds in the fascia (28). After the first fascia (28) is put in, a solid core (36) can be fitted inside the frame (30) to add strength to the panel (38). In the configuration shown in **Figs. 5abc**, the frame (30) is made up of element 1b (200) for the top and bottom horizontal frame (30) and profile 2b (600) is used for the left and right sides. Of course permutations are possible and element 1b (200) could be placed vertically and profile 2b (600) horizontally, it all depends on the orientation of the panel (38) as a whole and the terms horizontal and vertical are strictly to facilitate description in the context of **Figs. 5abc**. Also, **Fig. 9abc** shows both the front and back of a panel with the difference when the front side **Fig. 9b** has element 1d (400) at the top and **Fig. 9c** which shows the back of the panel without element 1d (400). The apparent frame is the edge (16) of element 1b (200). As can be best appreciated from **Fig. 4b**, fascia (28) is inserted into slits (42) of element 1b (200) while the solid core (36) is encased within elements 1a (100) on at least two sides, possibly all four.

This is but one of many possible panel (38) configurations. Inserting a second fascia (28') as in **Fig. 2a** for the second face of the panel (38) is different than inserting the first fascia (28). As explained earlier, after inserting the first fascia (28) the frame (30) is closed in so that the second fascia (28') can hardly be inserted in a way where its perimeter is inserted into the slits (42). In order to achieve insertion of the second fascia (28'), it is first bent convexedly and then relaxed so that the edges along its length can slide into slits (42) of element 1b (200) and then it is slid along its length so that its first wide side can be fitted into yet another slit (42). At this point, 3 out of 4 sides are properly inserted into slits (42), now for the second wide side, the final side, the second fascia (28') having been cut slightly shorter in length than the first fascia (28), has a gap left between it and the fourth slit (42), this gap is filled in by element 1d (400) as per **Fig. 2a** which is fitted so that its little hook (22) engages a complementary notch (44), part of element 1c (300). Inserting element 1d (400) thusly still leaves a little gap which is filled by the spacer trim (26) inserted between element 1d (400) and the edge (16).

This method of installation, with minor variations, is applied to the various panel (38) configurations. Looking back at **Fig. 5 a,** one side shows a configuration as per **Fig. 7a** while the other side, because it is framed using element 1a (100) would look more like **Fig. 7b** or **Fig. 7d**.

For a panel with glass as per **Fig. 8a**, profile 2a (600) is used with a pane of glass (50) along with element 1a (100) on either side acting as a framing device. A seal (52) can be readily accepted by element 1c (300). Sealing gaskets (54) can also be

inserted in available channels (56) made into element 1b (200) and element 1c (300)

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Element 1b (200) can have different thicknesses while keeping the rest of its profile identical, this allows for various thicknesses in panels.

Doors such as for cupboards can be made by adding hinges (58) and a handle (60) as in **Figs. 6ab**.